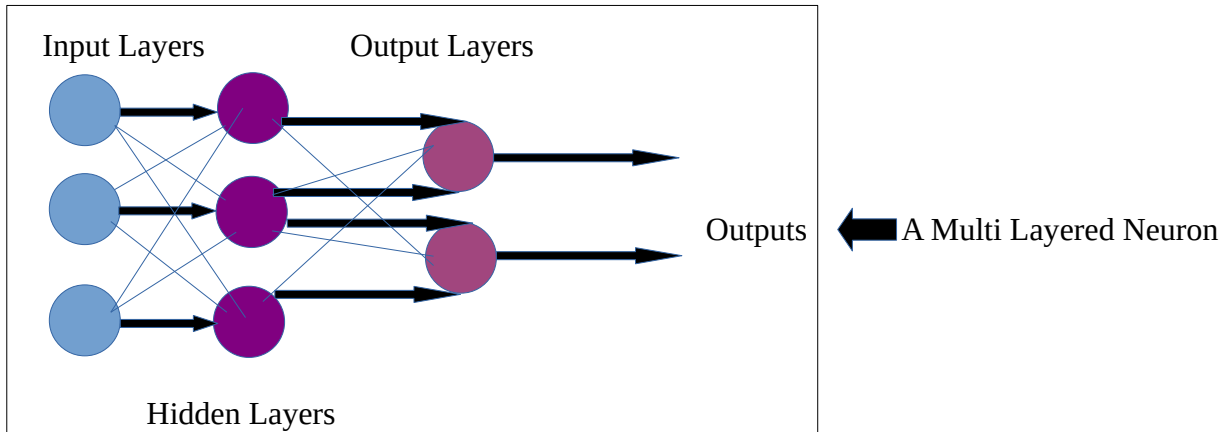


Understanding Neural Networks

With advancements in computer systems, a thought came that is it possible to link the thinking of a human being with that of a computer so as to perform complex actions. Thus arose the concept of neural networks. A neural network is a series of algorithms working together to process information.



Neurons learn from perceptions which are algorithms that take in inputs and combine them into a single output. Perceptrons can be Single layered (only contain input and output layers) or Multi Layered (consists a hidden layer in addition to perform mathematical operations).

Let us now understand the working. The main or the central part of a neural network is a neuron. Similar to the neurons in a human brain that process information, these neurons receive input, apply various operations and then give the desired output. The neurons are connected together with pathways called Synapses that carry information between different layers. These pathways include weights that is they determine how much importance should be given to a certain path. In addition there are biases which take various variations into account and give the best possible output. Finally there are activation functions which decide if a neuron should be activated or inactivated based on the input. So once a neuron receives all its inputs, each input is multiplied by its corresponding weights and biases and added together (summation). This is then passed to the activation function and if it is satisfactory then the function is activated and an output is received.

There are several ways to activate a function. The first one is threshold functions where if the summation is greater than a certain value then the function is activated. The disadvantage is that it is a sudden change. Hence the next method is Sigmoid functions which produces values between the range of 0 and 1. The value multiplied by 100 gives its percentage of probability hence unlike threshold functions it is a continuous function. Next are Rectified Linear Unit functions that outputs 0 if the number is negative and the number itself if the number is positive. There are other methods also.

Hence from the above document I was able to understand that how with the help of various mathematical processes and methods we are able to feed data to computers. Recently I learned about NLP's which also used different methods to convert human language to numbers for ML model processing. So are they the same? On further research I found out that NLP's deal with the linguistics while Neural Networks deal with various domains. A NLP may use a neural network to process info but not vice – versa.